

Name: \_\_\_\_\_

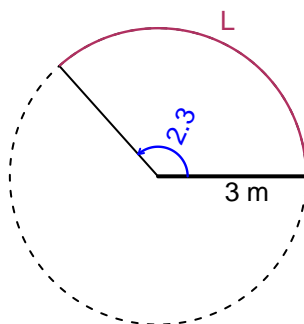
Date: \_\_\_\_\_

## Trig Final (Practice v33)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

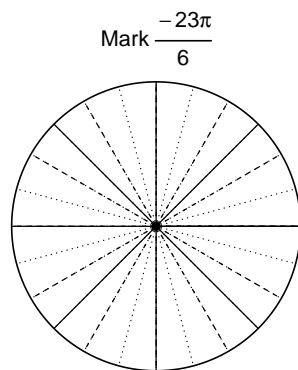
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is  $2.3$  radians. The radius is  $3$  meters. How long is the arc in meters?

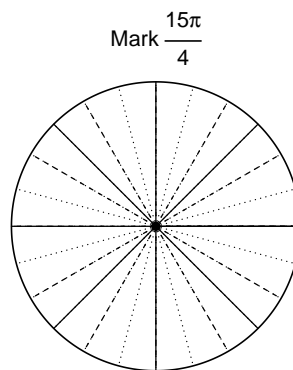


### Question 2

Consider angles  $-\frac{23\pi}{6}$  and  $\frac{15\pi}{4}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(-\frac{23\pi}{6}\right)$  and  $\sin\left(\frac{15\pi}{4}\right)$  by using a unit circle (provided separately).



Find  $\cos(-23\pi/6)$



Find  $\sin(15\pi/4)$

**Question 3**

If  $\cos(\theta) = \frac{-39}{89}$ , and  $\theta$  is in quadrant II, determine an exact value for  $\sin(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with a midline at  $y = -6.63$  meters, a frequency of 5.22 Hz, and an amplitude of 4.12 meters. At  $t = 0$ , the mass is at the minimum height. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).